

**METHOD FOR MANUFACTURING SEMICONDUCTOR  
DEVICES BY MONITORING NITROGEN BEARING  
SPECIES IN GATE OXIDE LAYER**

**ABSTRACT OF THE DISCLOSURE**

A method for processing integrated circuit devices. The method includes introducing a test wafer into a production run of wafers to form a run of wafers to be processed. Each of the wafers is before a gate dielectric production process. The method inserts the run of wafers into a process for gate dielectric production, e.g., gate oxide. The method forms a silicon oxynitride layer to a predetermined thickness of less than 30 Angstroms at a predetermined temperature using a nitrogen bearing species and an oxygen bearing species, alone or in combination. The method removes the test wafer from the run and forms a second oxidation overlying the silicon oxynitride layer to a second thickness, which is based substantially upon a nitrogen bearing concentration in the silicon oxynitride layer. The method determines a difference value between the first predetermined thickness and the second thickness. A step of correlating the difference value to one of a plurality of nitrogen concentrations to determine a nitrogen concentration in the first predetermined thickness is included.

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